Influenza

Disease and Epidemiology

Causative agent:
Influenza A and B are caused by viruses. These are RNA viruses from the *Orthomyxoviridae* family. Influenza A viruses are subtyped by their HA (hemagglutinin) and NA (neurominidase) membrane glycoproteins.

Clinical Description:
Influenza is an acute respiratory disease characterized by fever, headache, myalgia (body aches), prostration, coryza (runny nose), sore throat, and cough.

Laboratory identification:
Influenza can be identified via:

- Culture – direct growth of the virus, time-consuming, but has the advantage of being able to subtype the A viruses
- PCR – nucleic acid-based detection, rapid, but expensive and not widely available
- DFA – direct detection of the virus in samples, rapid, fairly good sensitivity and specificity, can't subtype the A viruses
- Rapid Tests – direct detection of the virus in samples, rapid, can have mediocre sensitivity and specificity, most can't differentiate between Influenza A and B

Treatment:

Generic name	Trade name	Effective against:	Licensed for ages:
Amantadine	Symmetrel	A	1 year and older
Rimantadine	Flumadine	A	13 years and older
Oseltamivir	Tamiflu	A and B	1 year and older
Zanamivir	Relenza	A and B	7 years and older

Treatment should be started early in illness (within 48 hours of onset) in order to reduce symptoms and viral shedding.

Case fatality:
Influenza, by itself, is rarely fatal. However, people in high-risk categories are subject to secondary infections that can be life threatening. It can be difficult to determine whether deaths were due to influenza. Therefore, influenza mortality is typically summarized using statistical calculations to derive "excess mortality" attributed to pneumonia and influenza.

As of 2004, pediatric mortality related to influenza is a nationally-notifiable condition.

Reservoir:
Humans are the primary reservoir for human influenza, but many influenza species can also infect birds (predominantly poultry) and mammals (such as swine). Genetic re-assortment is thought to occur during emergence across species.

Transmission:
Influenza is thought to be transmitted primarily via droplets, but can also be spread via direct contact. The virus has good persistence in the environment. Attack rates range from 10-20% in the general population, but can be as high as 50% in closed populations such as nursing homes.

Incubation period:
Influenza has a short incubation period, 1-3 days.

Period of communicability:
Influenza is transmissible from 1 day prior to onset of symptoms until 3-5 days after onset, but can be transmitted up to 7 days after symptom onset in children.

Susceptibility:
All humans are thought to be susceptible to influenza, although certain high-risk populations are more likely to suffer from severe illness or death. These high-risk populations include:

- Children under 2 years of age
- Adults over 65 years of age
- Adults with pulmonary illness (such as emphysema, chronic bronchitis, or asthma)
- Adults with cardiovascular illness (such as congestive heart failure)
- Adults with chronic metabolic disease (such as diabetes)
- Adults with kidney dysfunction, hemoglobinopathies, or immunosuppression
- Children 6 months – 18 years on long-term aspirin therapy

Epidemiology:
Influenza generally occurs as annual epidemics, typically between October and April. The epidemic normally lasts between 3 and 6 weeks, but cases can occur before and after the epidemic. Type A influenza is typically more severe than Type B.

Influenza A can exhibit antigenic drift (small genetic changes that are immunologically distinct) or antigenic shift (large genetic changes that can produce pandemics, or global epidemics).

The highest attack rates are in children aged 5-9. Approximately 1% of children with influenza will require hospitalization.

Public Health Control Measures

Public health responsibility:
Public health tracks the timing, magnitude, and severity of the annual epidemic. Public health should also watch closely for possible changes in the epidemic that would be consistent with agent mutation or the introduction of another agent (such as SARS or avian influenza) into the population.

Prevention of transmission:
The primary method to prevent transmission is vaccination. When vaccine supplies are limited, vaccination should be encouraged in high-risk populations that are at greater risk of severe disease or death. These populations include small children, adults over the age of 65, adults with chronic illnesses, pregnant women, and healthcare workers with direct patient contact. For a complete listing of high-risk populations, visit www.cdc.gov/flu.

Vaccine efficacy in healthy subjects ranges from 50-95% with an average of 70-80%. Vaccines are not licensed for children less than 6 months. Vaccine protection is presumed to last less than 1 year.

Other means of preventing influenza include "respiratory etiquette". This includes:

- Staying away from other people when you are sick. Don't go to work, school, church, or other places where people gather.
- Covering your mouth and nose when you cough or sneeze. Use a disposable tissue and throw it away when you are done.
- Washing your hands frequently.

Prophylaxis:
Unimmunized patients who are exposed to influenza (this is most likely to occur in closed facilities such as nursing homes, but can also occur with unimmunized high risk patients exposed to family members with influenza) can be prophylaxed with antiviral drugs.

Isolation and quarantine requirements:
HICPAC recommends droplet precautions in hospitalized patients. There are no other isolation or quarantine requirements for this disease.

Identification of case contacts:
Not applicable.

Case contact management:
Not applicable.

Case Investigation

Reporting:

Laboratory-identified influenza is a reportable disease in Utah. It is not a nationally-notifiable disease.

Influenza-associated pediatric mortality is a reportable disease, both nationally and in Utah.

Case definition:

Influenza

A confirmed case of influenza is one that has been diagnosed via culture or DFA.
A probable case of influenza is one that has been diagnosed via rapid test.

Influenza-associated pediatric mortality

An influenza-associated pediatric death is defined for surveillance purposes as a death in a child less than 18 years of age resulting from a clinically compatible illness that was confirmed to be influenza by an appropriate laboratory or rapid diagnostic test. There should be no period of complete recovery between the illness and death.

Case Investigation Process:

- Please fill out the Influenza Morbidity Report Form on each case of laboratory-identified influenza. Please do NOT use the general Morbidity Card. All data from this form should be entered into NETSS.

  To ensure that the collected data is properly captured for analysis, please use the following conventions this year when entering data into NETSS.

  - EventName = Influenza
  - LabResult = A, B, or UNDIF (which would be "undifferentiated")
  - Result (on the supplemental screen) = Culture, DFA, or Rapid
  - Case Status = 1 for all positive DFA and culture tests for influenza
    = 2 for all positive rapid tests for influenza
  - Other Data (on the first screen) = vaccination status. Please indicate:
    - Vacc = yes – month
    - Vacc = no
    - Vacc = unk

- Please fill out the Influenza Morbidity Supplemental Form only if your case:
  - Reports recent travel to Asia
  - Is (was) hospitalized
  - Died

  The fields for this form are not in NETSS, so please fax this form into UDOH Epidemiology at (801) 538-9923.

- Please fill out the CDC Influenza Pediatric Death Case Report Form if your case dies and is under the age of 18. The fields for this form are not in NETSS, so please fax these forms into UDOH Epidemiology at (801) 538-9923.

Utah Department of Health
Office of Epidemiology
October 28, 2004